Updated DoD 5000 and CJCS 3170 Policies: A Requirements to Acquisition Gap Analysis

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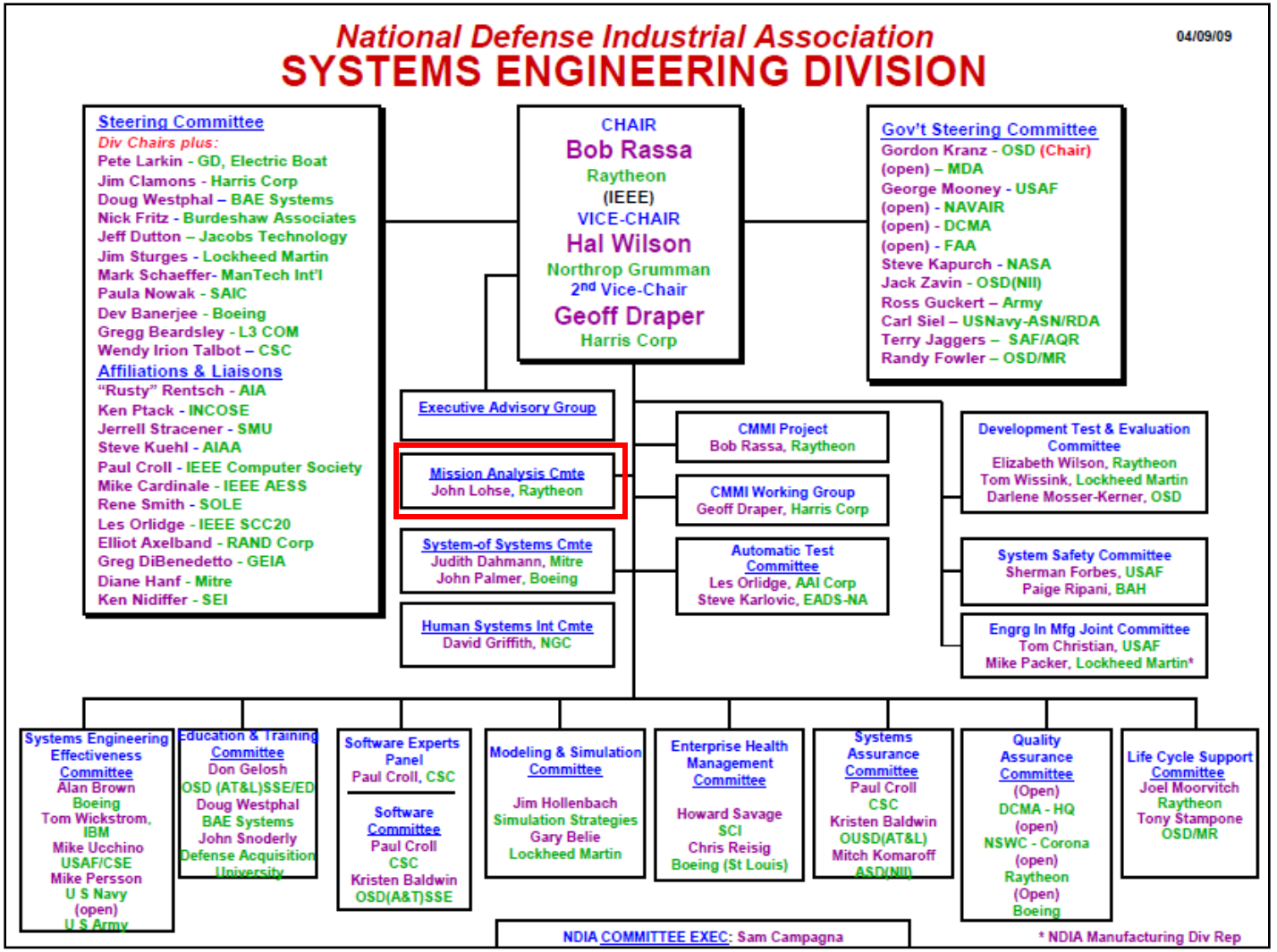
Co-Chair: NDIA SE Division Mission Analysis (MA) Committee

28 October 2009

Agenda

- Mission Analysis Committee
- Requirements to Acquisition Study
- Transition From ICD to the AoA
- Early SE Development Planning
- Summary

Mission Analysis Committee



- http://www.ndia.org/Divisions/Divisions/SystemsEngineering/Pages/Mission.aspx

Mission Analysis Committee

Charter

To provide a forum where government, industry, and academia can share lessons learned, promote best practices, address issues, and advocate the role of Pre-Milestone A Mission Analysis in the Systems Engineering process. The primary purpose is determining successful strategies for incorporating mission analysis principles and their relationships to CONOPS, Mission Architecture, M&S, etc. to provide better Warfighter solutions.

Mission Analysis Committee

- **Committee Objectives**
  - Understand the impact of the new DoD 5000.02, DAG, and CJCS 3170 on Pre-Milestone A Systems Engineering
  - Determine a common lexicon for Mission Analysis terminology
  - Strengthen the Systems Engineering methodology for dealing with high level of abstraction Mission Analyses
  - Understand the relationship of CONOPS, Mission Architecture, M&S, etc. to the Mission Analysis Process
  - Define the way Industry can better support JCIDS Capability Based Assessments through Mission Analysis
  - Evaluate and provide recommendations on policy and guidelines as to their impact on Pre-Milestone A Systems Engineering activities
  - Provide best practices for Pre-Milestone A Mission Analysis and other Pre-Milestone A Systems Engineering activities.
  - Etc.

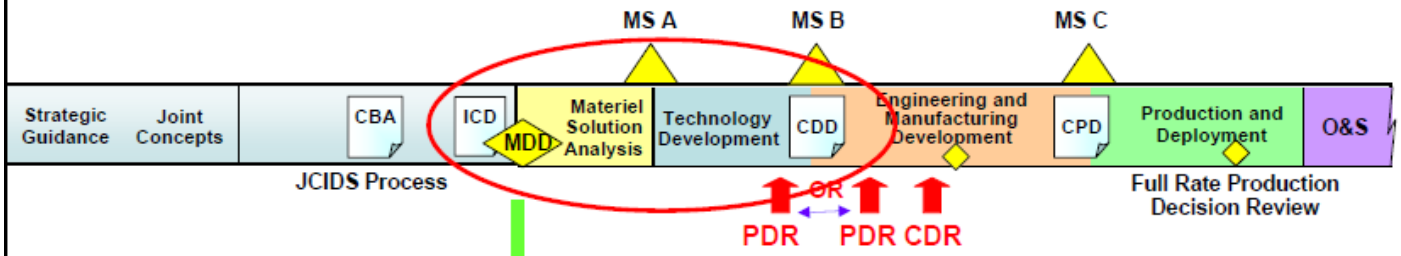
Requirements to Acquisition Study

New Opportunities for Systems Engineering – Starting Programs Right

Systems and Software Engineering

What's relevant:

- ***Mandatory*** Materiel Development Decision
- ***Mandatory*** Milestone A for all "major weapon systems"
- ***Mandatory*** PDR* and CDR* with reports to the MDA*



Pre-MDD "SE Touch Points"

- Initial Capabilities Document (ICD)
- Analysis of Alternatives study plan

Pre-Milestone A "SE Touch Points"

- Systems Engineering Plan
- Technology Development Strategy
- Test and Evaluation Strategy
- Analysis of Alternatives

** PDR – Preliminary Design Review* ** CDR – Critical Design Review* ** MDA - Milestone Decision Authority*

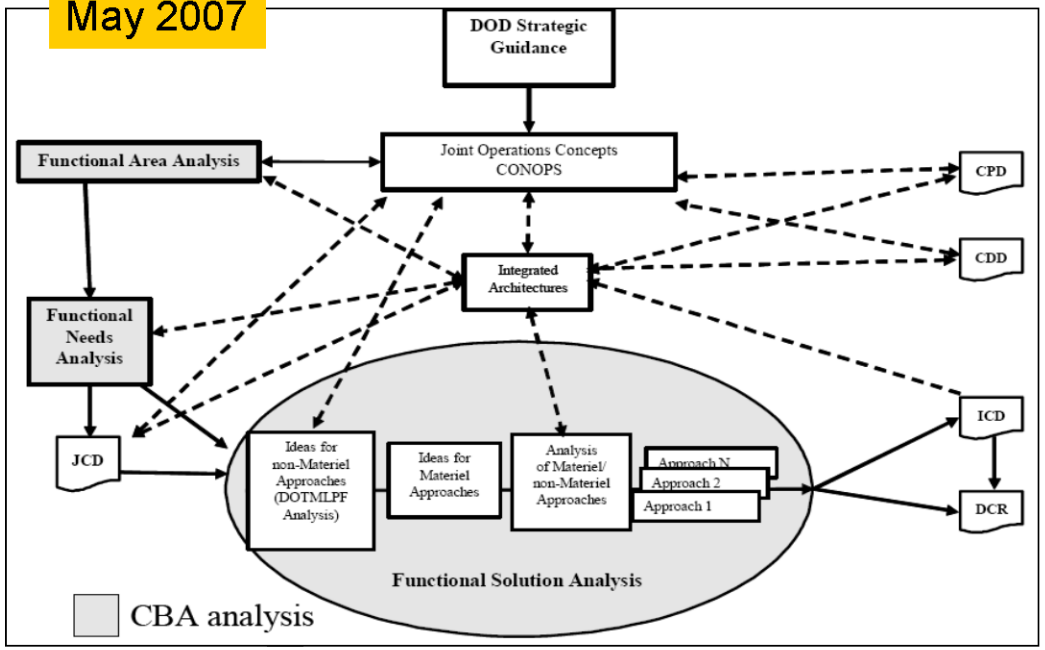
SYSTEMS & SOFTWARE ENGINEERING DIRECTORATE, DUSD(A&T) 16

Source: Mr. Gordon M. Kranz, ODUSD(A&T) Systems and Software Engineering
NDIA Systems Engineering Division Meeting
February 26, 2009

Requirements to Acquisition Study

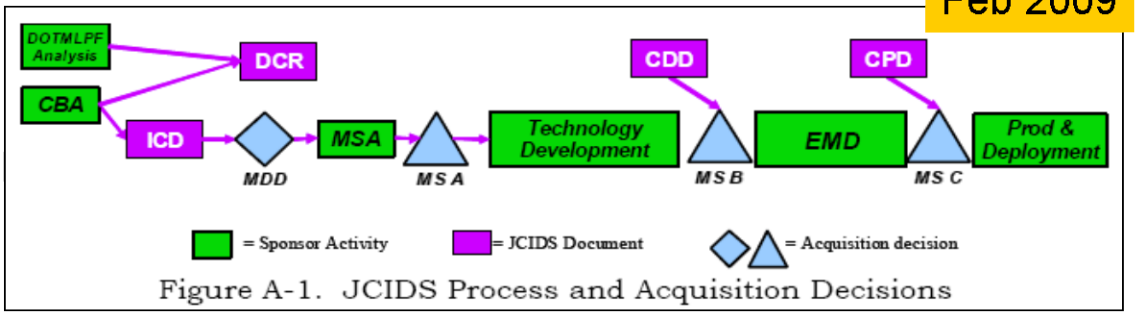
Recent JCIDS Evolution

May 2007



- Feb 2009 JCIDS eliminates references to FAA, FNA, FSA
- Is FSA-like work truly eliminated and, if so, to what extent?

Feb 2009

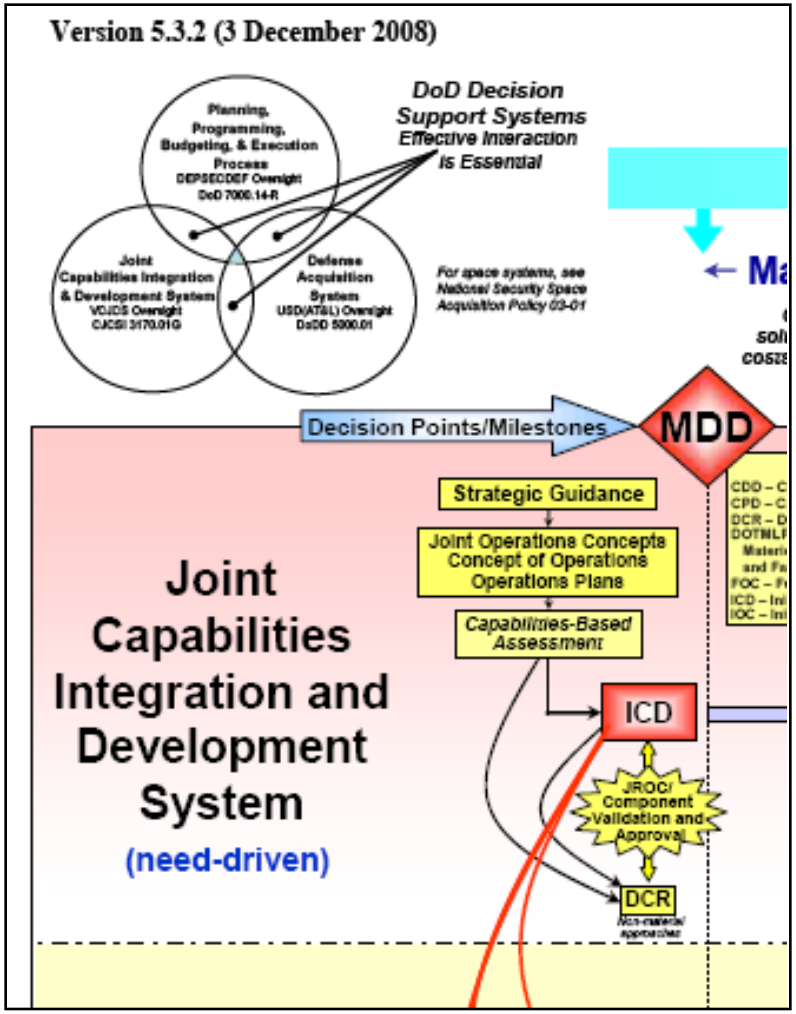


Requirements to Acquisition Study

- Top Level Goals
  - Understand the Transition from the Requirements process to the Acquisition process
  - Determine the attributes required for successful transition
  - Work with OT&E and DT&E to pull a thread for T&E in determining T&E specific attributes
    - Collaborative effort with the DT&E Committee

Transition From ICD to the AoA

Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System



Initial Capabilities Document (ICD).• A document that describes the need for a materiel approach to a specific capability gap derived from an initial analysis of materiel approaches. The ICD defines the capability gap in terms of the functional area, the relevant range of military operations, desired effects, and time. It summarizes the results of the Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) analysis and describes why non-materiel changes alone are not adequate to fully provide the capability. The ICD supports the Materiel Development Decision and Milestone A.

Transition From ICD to the AoA

APPENDIX A TO ENCLOSURE F

INITIAL CAPABILITIES DOCUMENT FORMAT

CLASSIFICATION OR UNCLASSIFIED
INITIAL CAPABILITIES DOCUMENT
FOR
TITLE

Validation Authority: _____

Approval Authority: _____

Milestone Decision Authority: _____

Designation: JROC Interest/JCB Interest/Joint Integration/Joint Information/Independent

Prepared for Materiel Development Decision
(or specify other acquisition decision point)

Date

- **ICD format and detailed content identified in the JCIDS Manual (Appendix A to Enclosure F)**
  - **No mention of MOEs, MOPs, COIs, etc.**

The ICD format and detailed content instructions:

1. Concept of Operations Summary.

2. Joint Capability Area.

3. Required Capability.

4. Capability Gaps and Overlaps or Redundancies

a. Describe, in operational terms, the missions, tasks, and functions that cannot be performed ….

b. Describe the attributes of the desired capabilities in terms of desired outcomes….

f. Definitions of the identified capabilities should satisfy two rules:

(1) Rule 1. Capability definitions must contain the required operational attributes with appropriate qualitative parameters and metrics, e.g., outcomes, time, distance, effect (including scale), obstacles to be overcome, and supportability….

5. Threat and Operational Environment

6. Ideas for Non-Materiel Approaches (DOTMLPF Analysis). 7. Final Recommendations

Mandatory Appendices

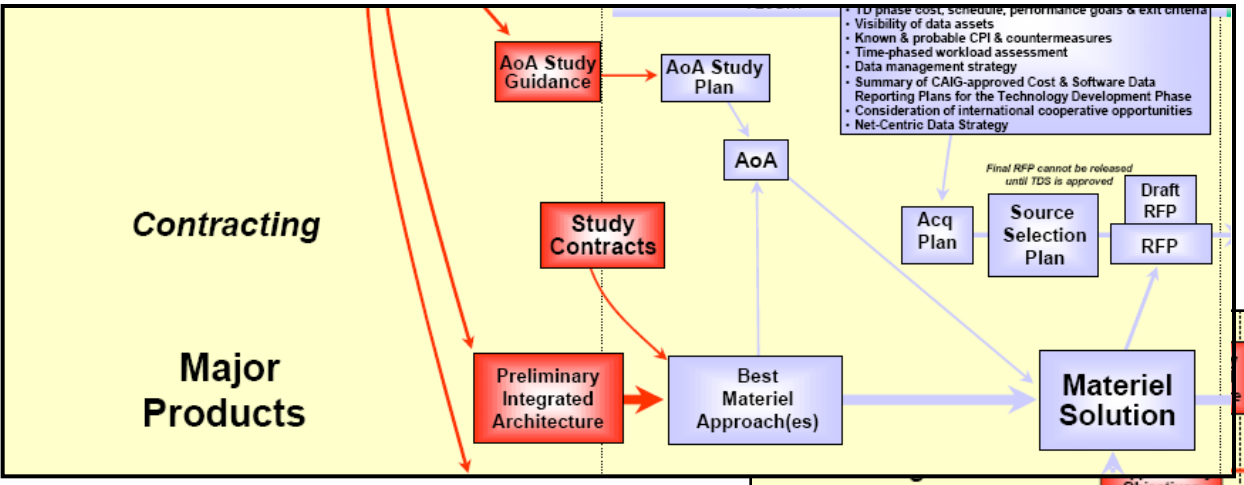
Appendix A. Integrated Architecture Products.

Appendix B. References

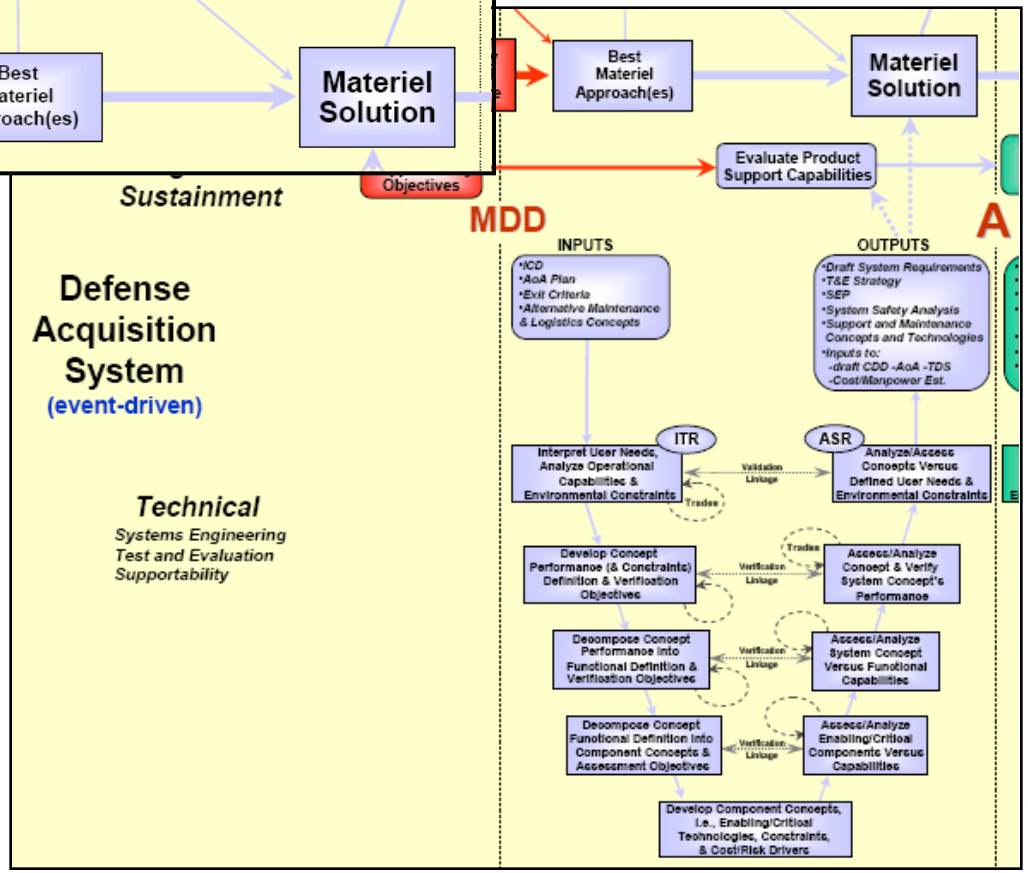
Appendix C. Acronym List

Other Appendices or Annexes.

Transition From ICD to the AoA

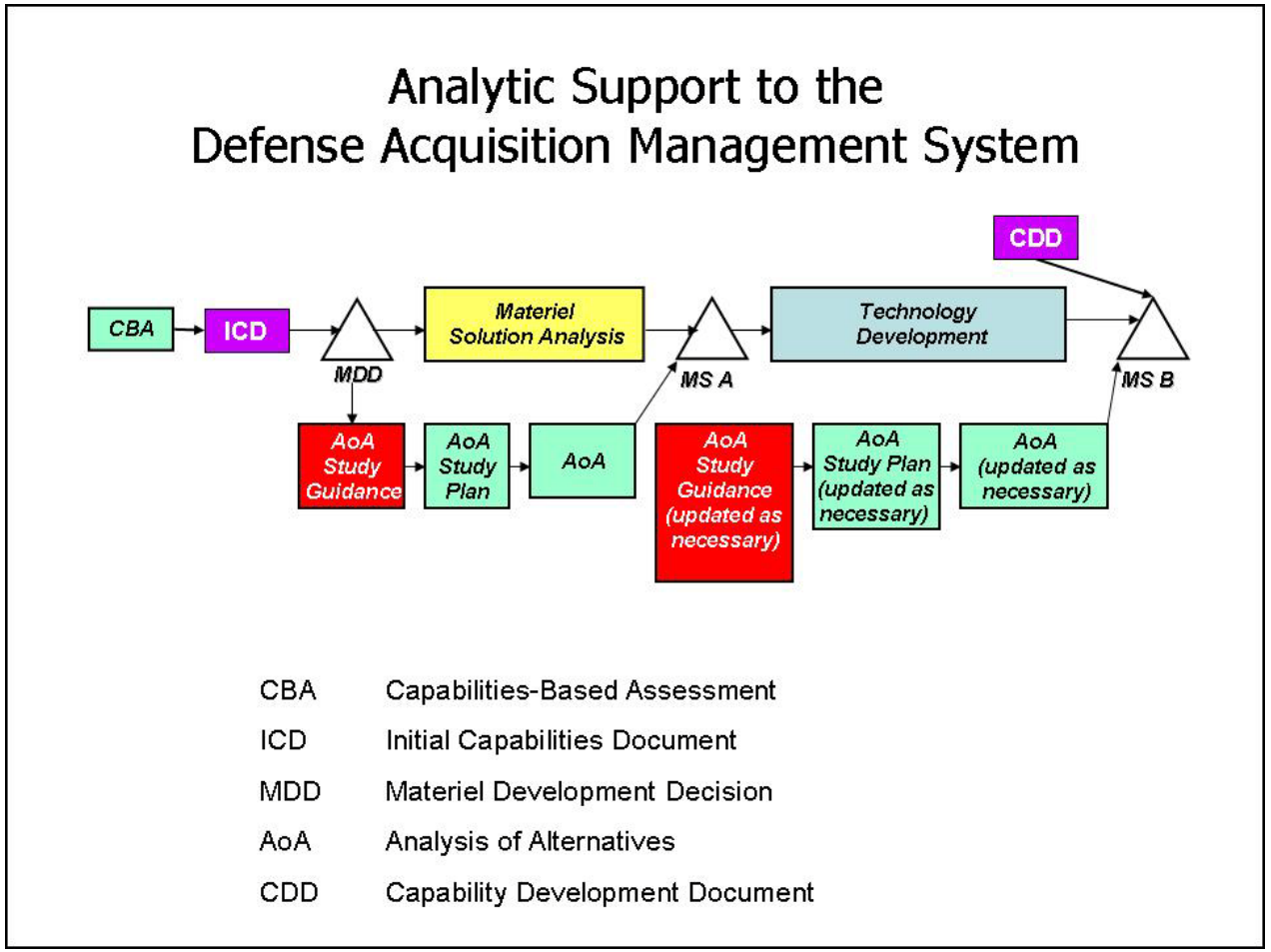


Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System



Materiel Solution Analysis Phase
AoA SE "V"

Transition From ICD to the AoA



Interim DAG 3.3.2
….At the Materiel Development Decision review, the Director, Program Analysis & Evaluation (DPA&E), or DoD Component equivalent, proposes study guidance for the AoA. The AoA study guidance is approved by the Milestone Decision Authority (MDA), and is provided to the lead DoD Component. Following approval of the AoA study guidance, the lead DoD Component prepares an AoA study plan that describes the technical approach and management of the AoA. A suggested template for the AoA study plan is provided in section 3.3.3. The study plan is coordinated with the MDA, and approved by the DPA&E, prior to the start of the AoA….

Interim DAG AoA Guidance

Transition From ICD to the AoA

Interim Defense Acquisition Guidebook, 3.3.3

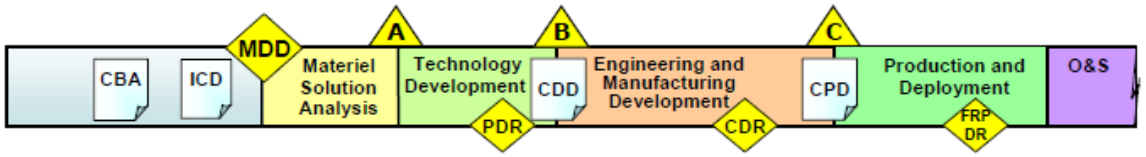
….A recommended outline for the AoA plan would resemble the following:

- Introduction <GB section 3.3.3.1>
  - ☐Background
  - ☐Purpose
  - ☐Scope
- Ground Rules <GB section 3.3.3.2>
  - ☐Scenarios
  - ☐Threats
  - ☐Environment
  - ☐Constraints and Assumptions
  - ☐Timeframe
  - ☐Excursions
- Alternatives <GB section 3.3.3.3>
  - ☐Description of Alternatives
  - ☐Nonviable Alternatives
  - ☐Operations Concepts
  - ☐Sustainment Concepts
- Determination of Effectiveness Measures <GB section 3.3.3.4>
  - ☐Mission Tasks
  - ☐Measures of Effectiveness
  - ☐Measures of Performance
- Effectiveness Analysis <GB section 3.3.3.5>
  - ☐Effectiveness Methodology
  - ☐Models, Simulations, and Data
  - ☐Effectiveness Sensitivity Analysis
- Cost Analysis <GB section 3.3.3.6>
  - ☐Life-Cycle Cost Methodology
  - ☐Additional Total Ownership Cost Considerations (if applicable)
  - ☐Fully Burdened Cost of Delivered Energy (if applicable)
  - ☐Models and Data
  - ☐Cost Sensitivity and/or Risk Analysis
- Cost-Effectiveness Comparisons <GB section 3.3.3.7>
  - ☐Cost-Effectiveness Methodology
  - ☐Displays or Presentation Formats
  - ☐Criteria for Screening Alternatives
- Organization and Management <GB section 3.3.3.8>
  - ☐Study Team/Organization
  - ☐AoA Review Process
  - ☐Schedule

Need to map the ICD content to the AoA Plan content. (Capability Requirements to MOEs/MOPs)

Early SE Development Planning

DP, SE and DT&E



DP: Development Planning
DT&E: Developmental Test and Evaluation
LCS: Life Cycle Sustainment
SE: System Engineering
CBA: Capabilities Based Assessment
CDD: Capability Development Document
CPD: Capability Production Document
ICD: Initial Capabilities Document
MDD: Materiel Development Decision

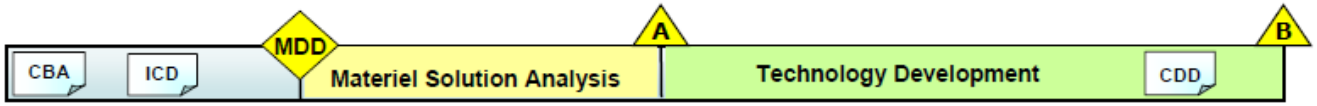
UNCLASSIFIED

Source: Mr. Nicholas Torelli, Deputy Director,
Office of the Director, Defense Research and Engineering/Systems Engineering
NDIA SE Division Meeting
August 6, 2009

Early SE Development Planning

DP (Early SE) Activities

What are the critical SE activities that occur between ICD and MS-B?



SE Input to MDD	CONOPS
	Awareness of Strategic Context
	Engagement with S&T
	Engagement with JCIDS
Engagement in AOA	Guidance
	Plan
	Analysis Activity
	Report
Engineering Analysis	Consideration of SOS/Interdependency, Interoperability Context
	SEP for MSA
	Input to TDS (CTE, CPI), TES, CCE
	SE in TD contract requirements
	Tech Reviews (ASR, Early SE Requirements)

Prototyping & Risk Reduction	Prototyping (Technology and Design)
	TRL Maturation
	Trade Studies
	SE Support for Technology Risk Reduction
	Oversight of Competitive Designs
	Risk Assessment
Input to Acquisition/ Planning, CARD, Budget and Other	SE in Contract Requirements
	SE Input into the pst-PDR Report, report to MDA, Acquisition Strategy, TEMP, CARD, and the ICE
Evidence of Strong SE Activity	PDR and Post-PDR Report and Assessment
	Tech Reviews up to and including PDR
	SEP
	Strong Reliability, Availability and Maintainability (RAM)
Inputs to Requirements	Systems Requirements Definition
	RAM and Sustainability
	Requirements Traceability Matrices
	Translation of Requirements to Contract
	Inform Capability Development Document (CDD)

*Reference DAG Sections 4.3.1 and 4.3..2

NDIA SE Division-WSARA 2009
08/06/09 Page-2

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NDIA SE Division Meeting
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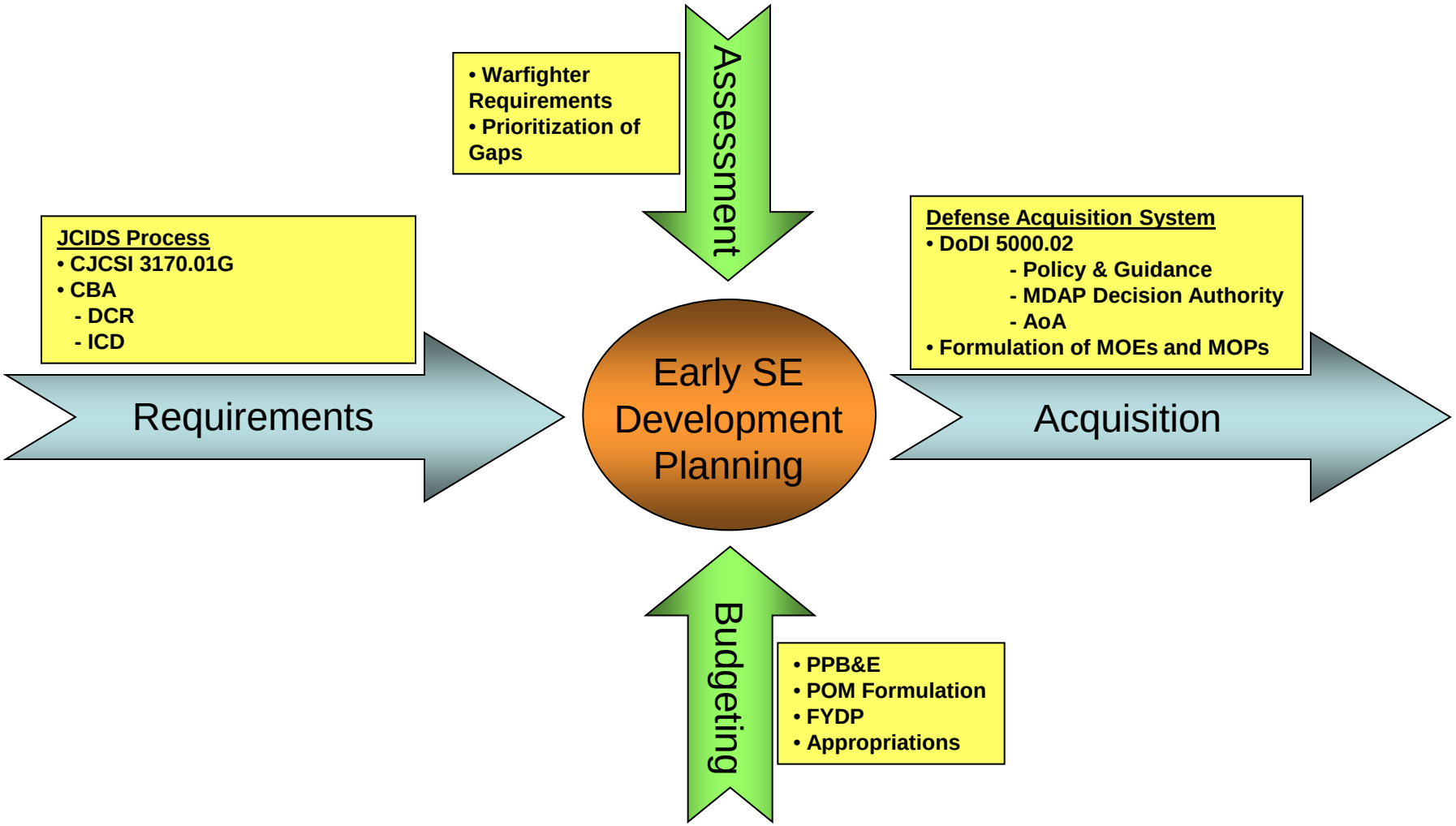
Early SE Development Planning



Summary

- NDIA SED Mission Analysis Committee established to focus on Pre-Milestone A Systems Engineering enhancement
  - All are welcome to join!

- Recent updates to the JCIDS and DoDI 5000.02 processes have left concern of new gaps in the transition from requirements to acquisition

- Early SE Development Planning must correlate between the mission context, ICD capability requirements, and the AoA MOEs/MOPs